Table 4. ELEVATION RANGES OF THE DIFFERENT WATER BODY TYPES IN THE BRUNEAU RIVER SUBBASIN

Elevation Range (meters)	609.6-914.4	914.4-1219.2	1219.2-1524	1524-1828.8	1828.8-2133.6	2133.6-2438.4	2438.4-2743.2	2743.2-3048	Subbasin Total km
Water Body Type	**Kilometers**								
Ditch	35.1	0.00	0.00	36.97	4.54	0.00	0.00	0.00	76.60
Intermittent	199.51	582.74	1361.12	1894.23	669.1	120.46	12.07	3.57	4842.81
Intermittent Shoreline	0.53	2.22	12.60	17.96	3.83	0.00	0.00	0.00	37.14
Shoreline	28.39	0.00	3.44	13.58	19.60	0.00	0.00	0.00	65.02
Stream	71.62	111.56	230.01	400.34	532.40	195.25	41.70	3.51	1586.38
Total	335.15	696.52	1607.17	2363.08	1229.47	315.71	53.77	7.08	6607.95

2.1.1.2 Wetlands/Riparian Areas

Wetlands and riparian areas are very limited throughout the subbasin. These areas are restricted to the canyon bottoms and along the perennial stream systems. Overall, riparian areas make up only 6.47 percent of the Idaho portion of the subbasin.

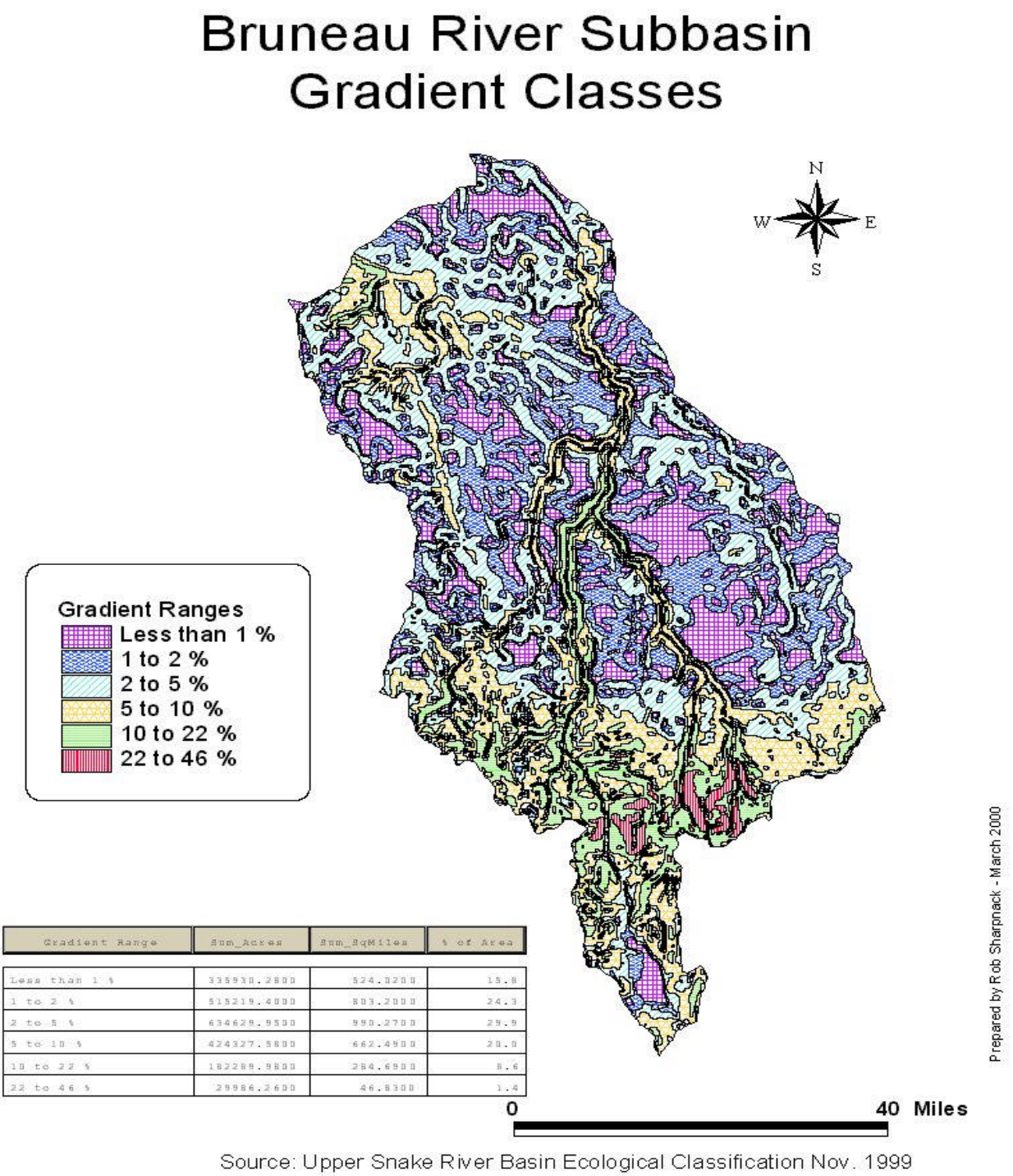
2.1.1.3 Soils/Geology

Local soils can be conceptualized as four soil provinces: the clayey and loamy soils of plateaus, the loamy soils of the fluvial canyons, the highly stratified alluvial soils of the area near the town of Bruneau, and the alpine glacial soils of the Jarbidge mountain province.

The average soil slope provides a gage of potential soil erosion, or risk erodibility. The topographic maps show that slopes are low (0-5 percent) on the plateaus, moderately steeper in the valleys and canyons (5-22 percent), and slopes increase appreciably as one approaches the bordering mountain ranges. The slopes are fairly steep in the mountain ranges, ranging from 10-46 percent (Figure 5.).

The "K-factor" is the soil erodibility factor in the Universal Soil Loss Equation (Wischmeier and Smith 1965). The factor is comprised of four soil properties: texture, organic matter content, soil structure, and permeability. The K-factor values range from 1.0 (most erosive) to 0 (nearly non-erosive). From the Owyhee county soil survey, K-factors on the flat slopes of the plateau soils range from 0.10 to 0.49. However, many of the soil types in this area (namely, soil types Wickahoney, Monasterio, Hat, Clevage, Longcreek, Willhil, Dougal, Bruncan, and Troughs) have K-factors that range from 0.10 to 0.24. On the soils of the main agricultural areas, such as near the town of Bruneau and in the canyon bottoms, K-factors range from 0.15 in the Payncreek soils to 0.49 in the Arbidge and Badlands soils. On the steeper, but rocky, unweathered slopes of the mountains, the erosion potential is low, with K-factors ranging from 0.10 to 0.24. Data from USEPA's modeling tool BASINs calculated area weighted K-factors for the Bruneau subbasin (Figure 6).

In general, the K-factors indicate that the rangelands have low-to-moderate soil erosion potentials. Because of this, sediment sources from the rangelands are also low. Due to the low erosion potential from the uplands, this Bruneau Subbasin TMDL will focus on valley bottom and channel sources of sediment for those streams on the 1998 §303(d) list with sediment as a pollutant.



Gradient Range	Sum_Acres	Sum_SqMiles	% of Area
Less than 1 %	335930.2800	524.8200	15.8
1 to 2 %	515219.4000	803.2000	24.3
2 to 5 %	634629.9500	990.2700	29.9
5 to 10 %	424327.5800	662.4900	20.0
10 to 22 %	182289.9800	284.6900	8.6
22 to 46 %	29986.2600	46.8300	1.4

Figure 5. Gradient Classes of the Bruneau River Subbasin.

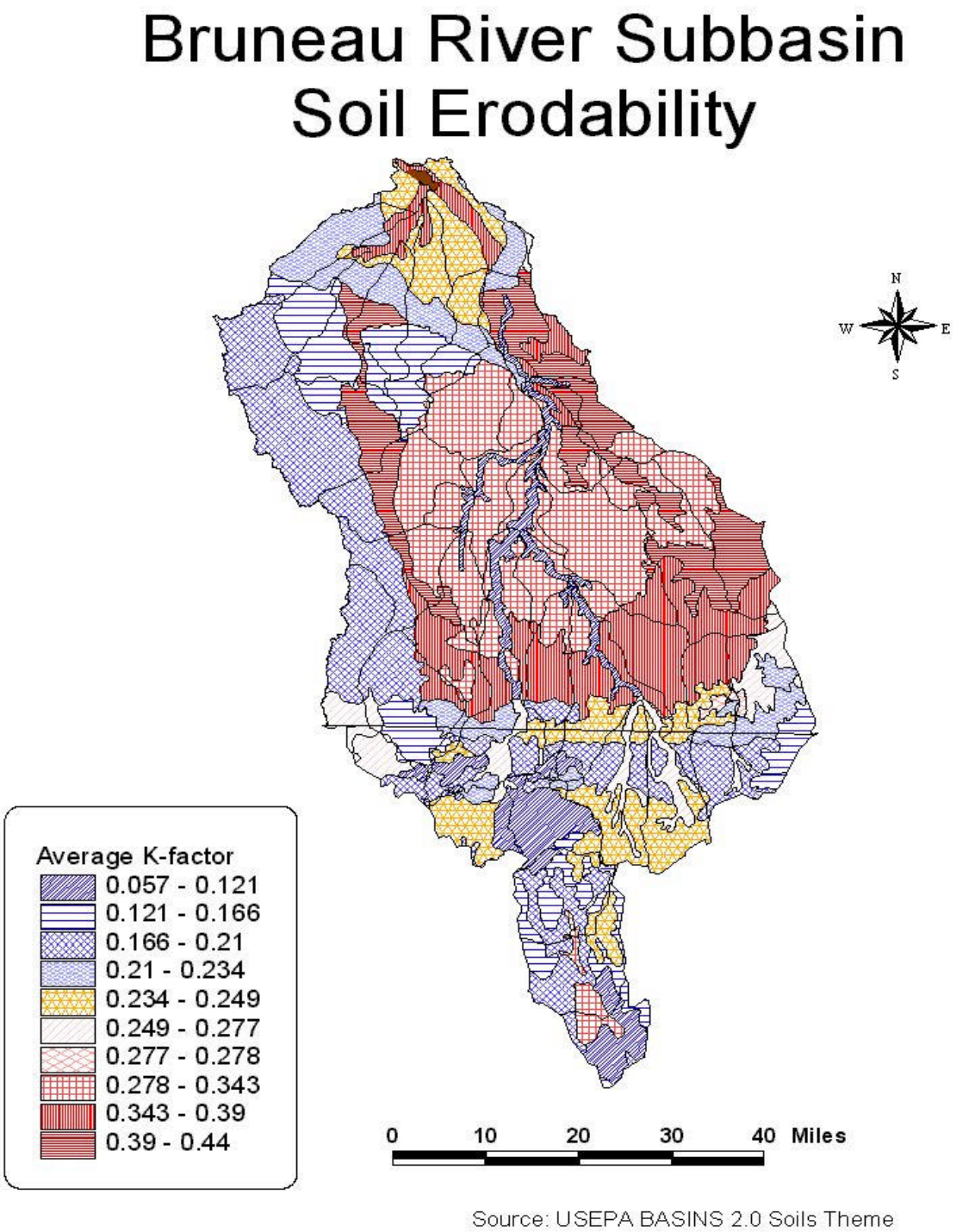


Figure 6. Average K-Factors of the Bruneau River Subbasin.

The overall geologic structure of the area is within the southern extent of the Snake River Plain Province. The Northern Basin and Range ecoregion crosscuts the basin in the south in Nevada. Locally thick deposits of loess (wind-blown silt) overlie these rocks, particularly in the volcanic Snake River Plain (Alt and Hyndman 1989). The Basin and Range is an area of faulted metamorphic and sedimentary rocks uplifted into mountains, separated by basins deeply filled with alluvium. The Snake River Plain is a deep, wide structural basin filled with a veneer of volcanic basalt deposits overlying rhyolite. The rocks decrease in age, from west to east, due to the migration of a magma source that has migrated to present-day Yellowstone National Park.

The geomorphology of the subbasin can be divided into seven geological subsections (Figure 7). Within each of these subsections, locally distinct geological formations can be found. The majority of the subbasin (75 percent including the Nevada portion) lies within the volcanic plateau subsection. Each geological subsection contributes sediment to the streams in various volumes. From Figures 5 and 7 it can be seen that the volcanic plateau subsection likely does not contribute significant sediment loads to the streams and rivers as its slopes are usually less than 5 percent.

2.1.1.4 Ecoregion/Vegetation

The Bruneau River Subbasin is predominantly within the Snake River Basin/High Desert ecological region (Figure 8), as described by Omernik and Gallant (1986) and Omernik (1986).

Most of the perennial streams in the ecoregion are large rivers originating in the adjacent mountainous ecoregion. The small mountain streams become intermittent at lower elevations predominantly due to evaporation and seepage, as well as irrigation and loss of bank storage. Scattered springs occur throughout the region, as do a moderate number of small reservoirs. A majority of the springs are geothermal in nature (see Figure 4).

Sagebrush/wheatgrass/needlegrass steppe is the dominant vegetation type throughout the region. Stands of juniper are also found in this area, as are large tracts of saltbush/greasewood. Some playas and recent lava flows are entirely devoid of vegetation. Streamside vegetation is generally the same as the surrounding regional vegetation due to the intermittent or ephemeral nature of most streams. Where perennial flow does occur, dense stands of sedges and forbs line the riparian zone. In perennial streams with moderate annual flow, woody vegetation consists of alder, willow, cottonwood, clematis, rose and mock orange.

Most of this region is used as rangeland. However, some areas within basins or bordering large streams are irrigated for pasture and production of potatoes, corn, alfalfa, sugar beets, mint, and grains. Where access by livestock is concentrated, loss or reduction of streamside vegetation is severe, causing stream bank erosion and sedimentation. Water withdrawal for irrigation often results in completely dry channels downstream from diversions.

Variability in the makeup of natural vegetation in the Bruneau River reach is minimal. Shrubland and grassland vegetation predominate the entire subbasin (96.6 percent in the Idaho portion) with limited riparian vegetation in the mainstem rivers (0.5 percent of the Idaho portion of the subbasin). Following the construction of irrigation canals and irrigation return drains, some of the natural sage-grass areas have been changed to support agricultural crops, pasture grasses and hay, and riparian vegetation.

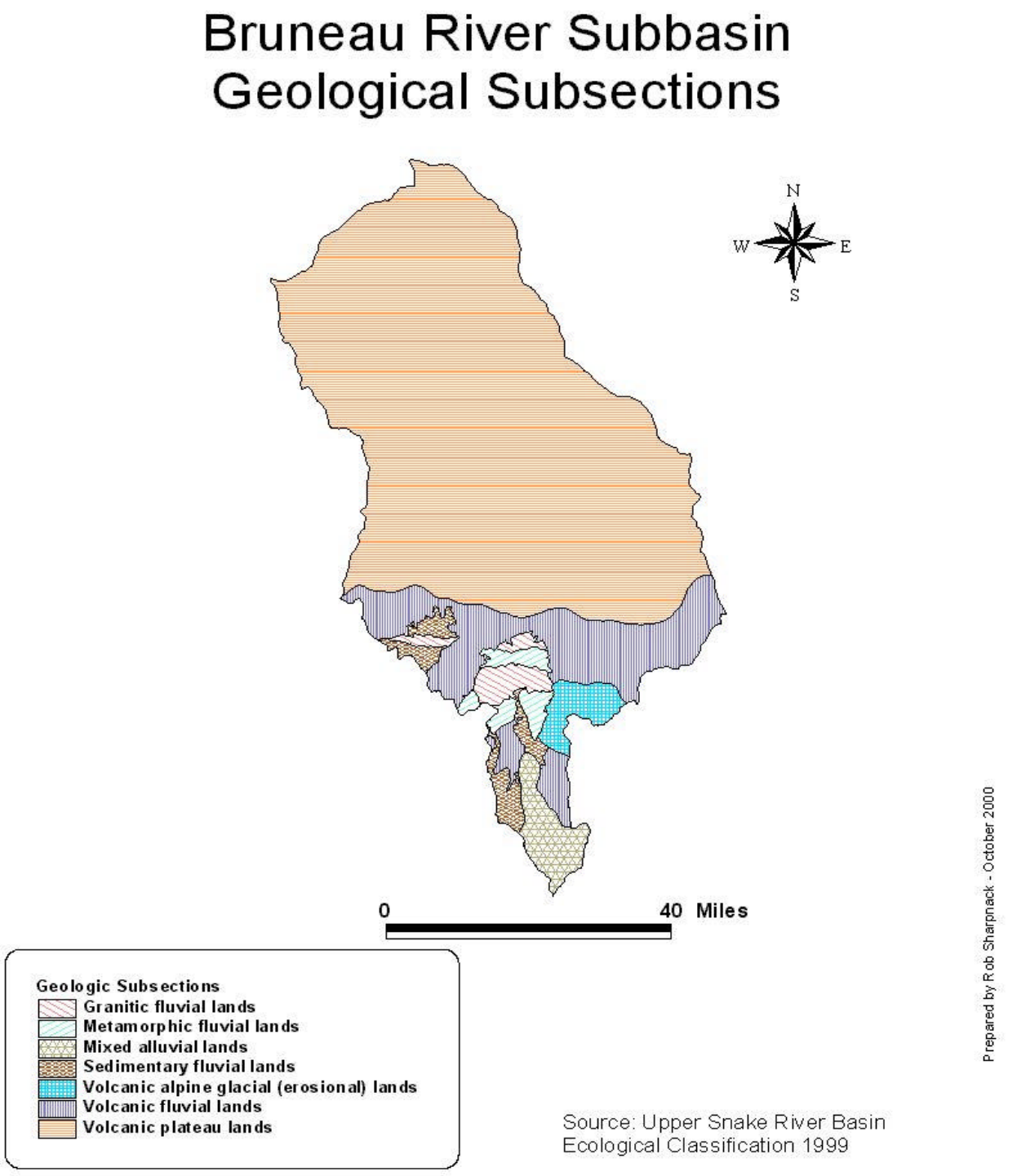


Figure 7. Geological formations of the Bruneau River Subbasin.

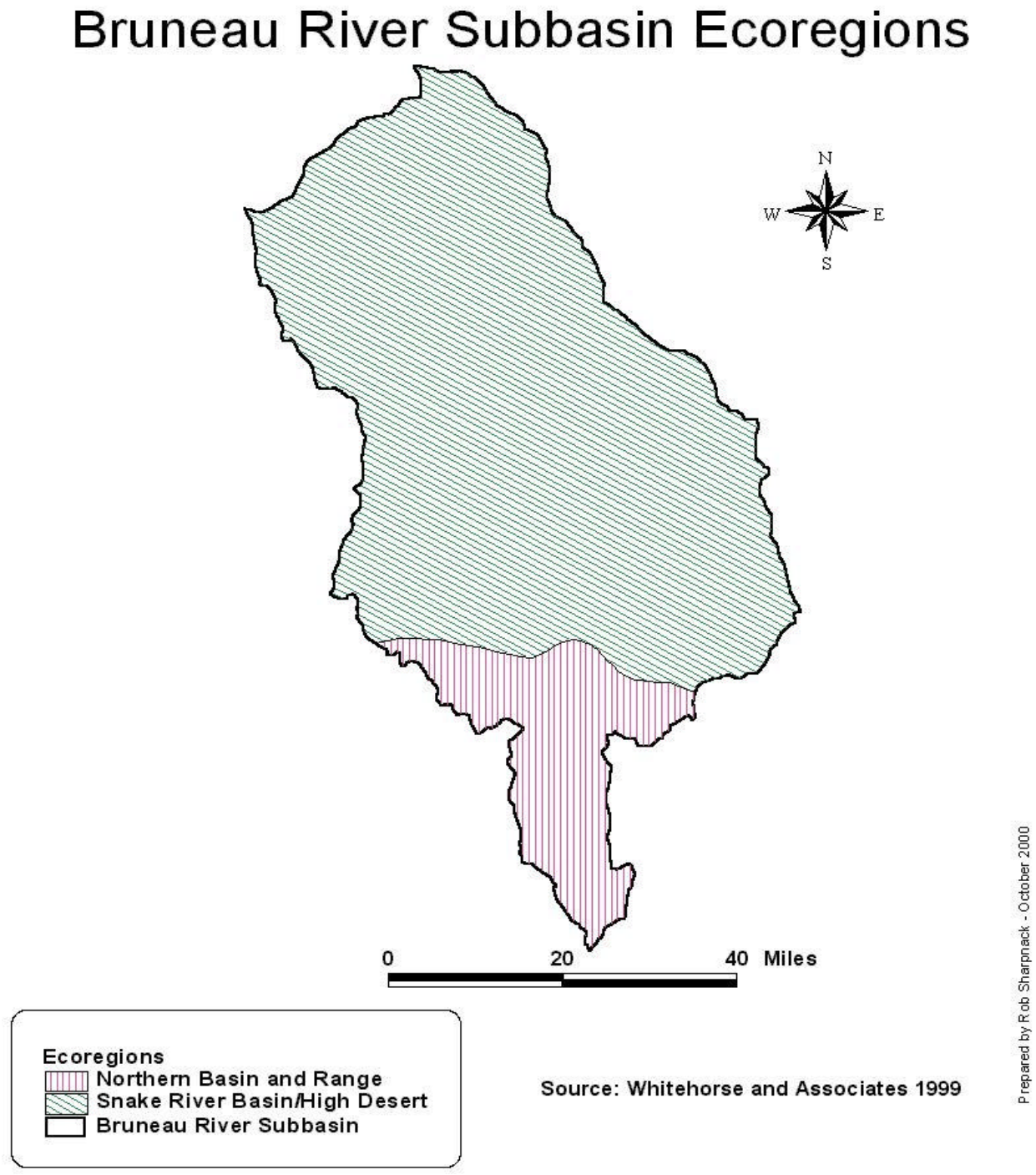


Figure 8. Ecoregions of the Bruneau River Subbasin.